

AD 765706

ORGANIZATIONAL RESEARCH

DEPARTMENT OF PSYCHOLOGY • UNIVERSITY OF WASHINGTON, SEATTLE, WASHINGTON

REPLICATION AND EXTENSION OF
EXPECTANCY MODELS FOR JOB EFFORT,
SATISFACTION AND PERFORMANCE

Earl Vinson
University of Colorado

and

Terence R. Mitchell
University of Washington

Technical Report 73-47

July, 1973

SR

D D C
REF ID: A629100
SEP 6 1980
B
ILLGUTTE

Reproduced by
NATIONAL TECHNICAL
INFORMATION SERVICE
U S Department of Commerce
Springfield VA 22151

DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

PL

AD-765 706

REPLICATION AND EXTENSION OF EXPECTANCY
MODELS FOR JOB EFFORT, SATISFACTION AND
PERFORMANCE

Terence R. Mitchell, et al

Washington University

Prepared for:

Office of Naval Research

July 1973

DISTRIBUTED BY:



National Technical Information Service
U. S. DEPARTMENT OF COMMERCE
5285 Port Royal Road, Springfield Va. 22151

ORGANIZATIONAL RESEARCH
DEPARTMENT OF PSYCHOLOGY
UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON

REPLICATION AND EXTENSION OF
EXPECTANCY MODELS FOR JOB EFFORT,
SATISFACTION AND PERFORMANCE

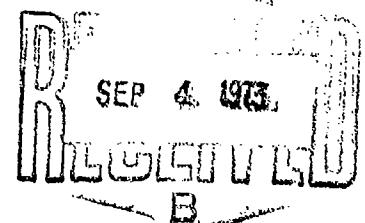
Earl Vinson
University of Colorado

and

Terence R. Mitchell
University of Washington

Technical Report 73-47

July, 1973



Contract NR 170-761, N00014-67-A-0103-0032
Office of Naval Research, Department of the Navy

REPRODUCTION IN WHOLE OR IN PART IS PERMITTED FOR ANY
PURPOSE OF THE UNITED STATES GOVERNMENT.

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

DISTRIBUTION STATEMENT A	
Approved for public release;	
Distribution Unlimited	

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author)	2a. REPORT SECURITY CLASSIFICATION Unclassified
Organizational Research Department of Psychology, University of Washington Seattle, Washington 98195	2b. GROUP

3. REPORT TITLE

Replication and Extension of Expectancy Models for Job Effort, Satisfaction and Performance

4. DESCRIPTIVE NOTES (Type of report and inclusive dates)

Technical Report 73-47, July, 1973

5. AUTHOR(S) (First name, middle initial, last name)

Earl Vinson and Terence R. Mitchell

6. REPORT DATE July, 1973	7a. TOTAL NO. OF PAGES 16	7b. NO. OF REFS 18
8a. CONTRACT OR GRANT NO. N00014-67-A-0103-0032	9a. ORIGINATOR'S REPORT NUMBER(S) TR 73-47	
b. PROJECT NO. 170-761	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned to this report)	
c.		
d.		
10. DISTRIBUTION STATEMENT		
Approved for public release; distribution unlimited.		
11. SUPPLEMENTARY NOTES none	12. SPONSORING MILITARY ACTIVITY Office of Naval Research	

13. ABSTRACT

Vroom's expectancy models for job effort, satisfaction and performance were tested and received moderate support. Also, five modifications or extensions of the theory are reviewed and empirically tested. In general, these changes suggested that the inclusion of others' expectations and the assessment of the subject's control over his behavior increased the predictability of the model. Intrinsic outcomes are more highly related to the criteria than extrinsic outcomes. Finally, unweighted models do as well as weighted ones for the job effort and satisfaction models. For the performance model there was no difference between additive or multiplicative combinations of its components. The implications of the suggested modifications for the revision of expectancy theory are discussed.

~~UNCLASSIFIED~~

Security Classification

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Expectancy Theory						
Satisfaction						
Job Effort						

REPLICATION AND EXTENSION OF EXPECTANCY MODELS FOR
JOB EFFORT, SATISFACTION AND PERFORMANCE¹

Earl Vines
University of Colorado

Terence R. Mitchell
University of Washington

Abstract

Vroom's expectancy models for job effort, satisfaction and performance were tested and received moderate support. Also, five modifications or extensions of the theory are reviewed and empirically tested. In general, these changes suggested that the inclusion of others' expectations and the assessment of the subject's control over his behavior increased the predictability of the model. Intrinsic outcomes are more highly related to the criteria than extrinsic outcomes. Finally, unweighted models do as well as weighted ones for the job effort and satisfaction models. For the performance model there was no difference between additive or multiplicative combinations of its components. The implications of the suggested modifications for the revision of expectancy theory are discussed.

¹This research was partially supported by the Office of Naval Research Contract NR 170-761, N00014-67-A-0103-0032 (Terence R. Mitchell, Principal Investigator).

REPLICATION AND EXTENSION OF EXPECTANCY MODELS FOR
JOB EFFORT, SATISFACTION AND PERFORMANCE¹

Earl Vinson
University of Colorado

Terence R. Mitchell
University of Washington

Since Victor Vroom's presentation of expectancy theory in 1964, numerous studies have been conducted to empirically test and refine the theory (see Mitchell and Biglan, 1971, and Heneman and Schwab, 1972, for reviews). While almost every investigation reported has shown some positive support for the theory, there have been a number of problems. First, the support has only been moderate at best. Second, the researchers frequently did not gather the theoretically correct measures to truly test the theory (see Heneman and Schwab, 1972). The response to these problems has been to test more accurate representations of the theory and to suggest modifications which might increase its predictive ability. The following research was meant to test Vroom's job effort, satisfaction, and performance models and to simultaneously deal with five possible refinements and modifications.

Theoretical Models

In general the theory suggests that an individual's attitude or behavior can be predicted from the degree to which the attitude or behavior is linked to various consequences weighted by the evaluation of those consequences.

Job Effort: This model is currently represented as follows:

$$W = E \left(\sum_{i=1}^n V_i \right)$$

where

W= Effort exerted on the job

E= the expectancy that effort will lead to good performance

I= The instrumentality of good performance for the attainment of various outcomes

V= the valence or importance of the outcome

N= the number of outcomes

Thus, one supposedly works hard if they believe that 1) working hard will lead to good performance, 2) that good performance will lead to other work related outcomes (e.g. high pay, a promotion, etc.) and 3) these work related outcomes are important to the individual.

Job Satisfaction: Job satisfaction is conceptualized as an attitude towards one's job and the model is presented below:

$$S = \frac{1}{n} \sum_{i=1}^n V_i$$

where

S= job satisfaction

I= the instrumentality of one's job or position for the attainment of work related outcomes

V= the valence or importance of the outcome

N= the number of outcomes

Thus, one is satisfied with his job if he believes the job is helpful in attaining outcomes which are highly valued or important to him.

Note that while the valence measure of the effort and satisfaction model is similar, the instrumentality measure is different. In the effort model instrumentality refers to the relationship between performance and outcomes while in the satisfaction model it refers to the position-outcome relationship (Graen, 1969).

Job Performance: The job performance model as originally suggested by Vroom and modified by Porter and Lawler (1968) uses ability, effort, and role perceptions as predictors of performance. Symbolically:

$$P = E \times A \times RP$$

where P = Performance

 E = Effort

 A = Ability

 RP = the specificity of the role requirements

One should have high performance if 1) he works hard, 2) he has the relevant abilities and 3) he knows what to work on.

Refinements and Extensions

A couple of points should be mentioned before proceeding to the areas tested in the current investigation. First, numerous studies have been conducted which helped to generate the above models. This developmental process is documented elsewhere (Mitchell and Biglan, 1971; Heneman and Schwab, 1972). Second, there are a number of methodological problems with the ways in which these theories have been generated which will not be dealt with here (see Mitchell, 1972, or Wahba and House, 1973). Some of these problems led to the refinements suggested below while others are as of yet unresolved.

Intrinsic vs. Extrinsic Outcomes: One modification suggested that intrinsic outcomes (things that are inherently pleasurable about doing the job) are more powerful motivators than extrinsic ones and that they lead to greater satisfaction (Mitchell and Albright, 1972). This idea suggests that we examine more fully the content of the EIV in both the effort and satisfaction models to determine which

aspects of the job are more clearly related to the criteria.

1. Use of Expectations and Motivation to Comply. Dulany, (1967), Fishbein (1967) and Graen (1969) all suggested that a social component should be added to the model. One would work hard not only because of the positive consequences in terms of job related outcomes [E (Σ IV)] but also because it was expected by his peers (Ex) and he was motivated to comply with their wishes (Mc). The work effort model becomes $W = E(\Sigma IV) + (ExMc)$. Some support for this idea has already been presented (Mitchell and Pollard, 1973; Mitchell and Knudson, 1973; Mitchell and Nebeker, 1973).

2. High vs. Low Control. A second modification of the effort model is based on the fact that the original model is meant to predict one's intention to work hard. In numerous cases one cannot carry out his intentions because of interruptions, dependence upon others or the uncertainty of the environment (e.g. machines break down, needed material is missing). It has been suggested that the relationship between W and E(Σ IV) should be greater for those who indicate they have high control over their behavior than for those who have low control.

4. Weighted vs. Unweighted Models. A number of authors have suggested that unweighted models (e.g. without the valence or importance component) predict the criterion as well or better than weighted ones (Mikes and Hulen, 1968; Sheard, 1970). Thus, effort and satisfaction could be predicted well from the expectancies and instrumentalities without the use of valences. There is some support for this idea in

other areas such as occupational choice (Mitchell and Knudson, 1973) or consumer behavior (Ressemier and Wilkie, 1973).

5. Multiplicative vs. Additive Models of Job Performance.

There is currently a suggestion that adding measures of ability, effort and role perceptions predicts performance as well or better than multiplicative models. Again, there are investigations which have supported both approaches (see Avey, 1972; Mitchell and Nebeker, 1973; Gavin, 1970). The purpose of the following research was to test all three models and the five modifications mentioned above.

Method

Subjects were selected from a number of profit and non-profit organizations and were primarily from Seattle, Washington, or Los Angeles, California. 800 questionnaires were distributed and 370 were returned for a response rate of 46%. Of those returned, only 352 were complete and usable. Some of the respondents were managers, professionals and clerical personnel. There were no major differences in terms of the effects of the profit/non-profit distinction or the position level on the tests of the models and we will therefore omit further discussions of these variables.

The questionnaires were the Employee Attitude Questionnaire (EAQ) and the Employee Behavior Questionnaire (EBQ). The EAQ assessed:

Part I--measures of expectancy, motivation to comply and others' expectations, control, and role perception,

Part II--measures of the instrumentality of successful job performance for the attainment of each outcome.

Part III--measures of the instrumentality of the position for the attainment of each outcome and measures of the importance of each outcome,

Part IV--self evaluation measures of job effort, performance, and satisfaction.

In general, each question was asked on a seven point bi-polar scale. For example E= to what extent will working hard lead to a good performance evaluation: Never 1 2 3 4 5 6 7 all the time.

The EBQ generated ratings by the employee's supervisor on the dimensions of the employee's ability, effort and performance. Seven point scales from High to Low were used. A more detailed description of these measures is available elsewhere (Mitchell and Albright, 1972; Vinson, 1973).

The intrinsic outcomes used were 1) feelings of self-esteem, 2) opportunity for independent thought and action, 3) opportunity for personal growth and development, 4) feelings of self fulfillment. 5) feelings of worthwhile accomplishment. The extrinsic outcomes were 1) security, 2) opportunity to develop close friendships, 3) salary, 4) promotion and 5) recognition.

Results

All three models received some support. The correlation of self effort with the E(SIV) was .30 ($p < .01$). The correlation of the job satisfaction model (SIV) with overall satisfaction was .51 ($p < .001$) and with satisfaction with position was .52 ($p < .001$). The correlation of intended effort [E(SIV)] times self-rated ability (Self A) times Role Perceptions (RP) with self-rated performance was .51 ($p < .001$)

and with supervisory performance was .27 ($p < .001$). When supervisory ratings are substituted to give the following equation: Supervisor rating of effort (Sup W) times supervisor rating of ability (Sup A) times RP the correlation with the supervisor's rating is .79 ($p < .001$).

The use of ExMc increased the predictability of the Job Effort Model. With these variables included in the equation the correlation with self-rated effort was .34 ($p < .01$) compared to .30 without them.

The subjects were split at the mean into groups of high versus low control of their behavior based on their response to the control question in the EAO. The correlation with self-rated effort was .39 ($p < .01$) for the high control subjects and .29 ($p < .01$) for those with low control. Again, these results are supportive of the hypothesis.

For the intrinsic/extrinsic hypotheses the results are in the right direction but hardly very startling. The correlation between self-rated effort and $E(\Sigma IV)$ int + ExMc was .35 ($p < .01$) and with $E(\Sigma IV)$ ext + ExMc was .33 ($p < .01$). For the job satisfaction model overall satisfaction (OS) correlated .52 ($p < .001$) with ΣIV int and .43 ($p < .001$) with ΣIV ext. The correlations with satisfaction with position (SP) were .51 ($p < .001$) for ΣIV int and .46 for ΣIV ext.

In every case the unweighted model (without valence estimates) did slightly better than the weighted model in predicting effort and satisfaction. For the job effort model the coefficient was .35 ($p < .01$) as compared to the .34 mentioned above. For the satisfaction model ΣI correlated with OS .56 ($p < .001$) as compared to the .51 for OS and ΣIV . The ΣI correlated .55 ($p < .001$) with SP whereas the weighted equation produced a value of .52. Similar findings were found using just

the intrinsic or extrinsic equations as well.

Finally, when comparisons of the multiplicative versus additive models are made there is little data to support the multiplicative position. Four equations can be generated: 1) add all three variables, 2) use all three variables are predictors in a multiple regression equation, 3) multiply all three variables and 4) take the \log_{10} of each variable and use a multiple regression equation. This latter approach parallels the additive multiple regression equation, because adding logs is tantamount to multiplying the untransformed variables. Thus, we can have both weighted linear combinations and unweighted ones for additive and multiplicative models. In every case there is very little difference in the comparisons for a specific equation. The additive multiple regression models showed a slightly better power to predict. Self W + Self A + RP produced a multiple R of .69 ($p < .01$) when predicting self-rated performance. Sup W + Sup A + RP produced a multiple R of .88 ($p < .01$) with supervisory-rated performance. None of the other equations were as high with the lowest being the sum of self-rating of effort, self ability and role perceptions correlating .07 with supervisory-rated performance.

Discussion and Conclusion

The purpose of this paper was twofold: First, we wished to present replication data for the major expectancy models. Second, we wanted to summarize in one place a number of modifications of these models. Numerous other analyses and comparisons could be made and we are aware of them and have carried most of them out. Intercorrelations

of the model components; the substantive content of the expectancies and valences (e.g. what outcomes are seen as most attainable and important); the relationship between superior and subordinate ratings of similar variables; the explanations for certain types of analyses and results. All of these are important questions. We have omitted them however, because most of these analyses (Vinson, 1973) and arguments are presented elsewhere (Mitchell and Albright, 1972; Mitchell and Nebeker, 1973; Mitchell and Pollard, 1973). In keeping with our goals, therefore, we feel the following conclusions are warranted based on all the investigations to date covering these points:

1. The expectancy models for job effort, satisfaction and performance consistently predict their respective criteria.
2. The inclusion of others' expectations increases the predictability of the job effort model.
3. The job effort model predicts actual effort better for those participants who say they have high control over their behavior than for those with low control.
4. Job effort and satisfaction are more highly related to intrinsic outcomes than extrinsic ones.
5. Unweighted models do equally well in predicting their criteria as do the weighted models.
6. There is little difference between additive and multiplicative models of job performance.

Conclusions 2, 3 and 4 suggest ways in which the original models can be modified while the last two suggest further research. While we seem to be obtaining a better idea of the kinds of antecedents of effort, satisfaction and performance, we still do not clearly understand

how these antecedents combine with one another. Perhaps future expectancy investigations should examine these problems more thoroughly.

References

Arvey, R. D. Task performance as a function of perceived effort-performance and performance-reward contingencies. Organizational Behavior and Human Performance, 1972, 8, 423-433.

Dulany, D. E. Awareness, rules, and propositional control: A confrontation with S-R behavior theory. In Horton, D. and Dixon, T. (Eds.) Verbal Behavior and General Behavior Theory, Englewood Cliffs, N. J.: Prentice-Hall, 1967, 340-387.

Fishbein, M. Attitude and the prediction of behavior. In Fishbein, M. (Ed.) Readings in Attitude Theory and Measurement, New York: Wiley, 1967, 477-492.

Gavin, J. R. Ability, effort and role perception as antecedents of job performance. Experimental Publication System, 1970, 5, Manuscrip No. 190A.

Graen, G. Instrumentality theory of work motivation: Some experimental results and suggested modifications. Journal of Applied Psychology Monograph, 1969, 53, (Whole No. 2, Part 2).

Heneman, H. G., III, and Schwab, D. P. An evaluation of research on expectancy theory predictions of employee performance. Psychological Bulletin, 1972, 78, 1-9.

Mikes, P., and Hulin, C. L. Use of importance as a weighting component of job satisfaction. Journal of Applied Psychology, 1968, 53, 394-398.

Mitchell, T. R. Instrumentality theories: Conceptual and methodological problems. JSAS Catalog of Selected Documents in Psychology, 1972, 2, 37.

Mitchell, T. R., and Albright, D. Expectancy theory predictions of the satisfaction, effort, performance, and retention of naval aviation officers. Organizational Behavior and Human Performance, 1972, 8, 1-20.

Mitchell, T. R., and Biglan, A. Instrumentality theories: Current uses in psychology. Psychological Bulletin, 1971, 76, (6) 432-454.

Mitchell, T. R., and Knudson, B. W. Instrumentality theory predictions of students' attitudes towards business and their choice of business as an occupation. Academy of Management Journal, 1973, 16, 1-51.

Mitchell, T. R., and Nebeker, D. M. Expectancy theory predictions of academic performance and satisfaction. Journal of Applied Psychology, 1973, 57, 61-67.

Mitchell, T. R., and Pollard, W. E. Instrumentality theory predictions of academic behavior. Journal of Social Psychology, 1973, 89, 35-45.

Porter, L. W., and Lawler, E. E. Managerial Attitudes and Performance. Homewood, Ill.: Irwin-Dorsey, 1968.

Ressemier, E. A., and Wilkie, W. L. Multi-attribute choice theory - a review and analysis, Krammart School of Industrial Administration, Purdue University, Lafayette, Indiana, Paper No. 372, September, 1972.

Sheard, J. L. Intra-subject prediction of preferences for organization types. Journal of Applied Psychology, 1970, 54, 248-252.

Vinson, E. An empirical investigation of differences in job motivation, performance, and satisfaction between black and white employees, unpublished doctoral dissertation, University of Washington, Seattle, Washington, 1973.

Vroom, V. H. Work and Motivation. New York: John Wiley, 1964.